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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/799,483

03/12/2004

Yin S. Tang

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EXAMINER

BLEVINS, JERRY M

ART UNIT

PAPER NUMBER

2883

MAIL DATE

DELIVERY MODE

10/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/799,483

Applicant(s)

TANG, YIN S.

Examiner

Jerry Martin Blevins

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
{ Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 7, 2007 has been entered.

### ***Response to Arguments***

Applicant's arguments filed September 7, 2007 have been fully considered but they are not persuasive.

Specifically, examiner maintains that the prior art reference to Okubo et al., US 5,565,978, teaches that application of energy to modify the end of the optical fiber members to form a lens surface achieves a focusing lens. Namely, column 8, lines 13-25 and column 10, lines 23-30, which directly present the application of energy to form a lens surface, mention that an alternative method would be to use a self-focusing lens placed at the end of the optical fiber. This would imply that the formation of a lens at a modified end of the optical fiber would also serve the role of focusing light. While it is correct that the fiber itself serves to expand light, the lens formed on the end of the fiber serves to modify the expansion, and namely, to at least partially focus the expanded

light. It is apparent to examiner that the modification can be controlled to provide any specific desired focal effects.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6, 7, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent to Thompson, number 5,037,174 in view of Okubo.

Regarding claim 1, Thompson teaches a method for manufacturing an optical fiber member (Figures 3A, 3B, 4) comprising: modifying at least one end of an optical fiber member (column 2, lines 14-46) to form an end continuously tapered to the outer circumference of the optical fiber member (Figures 3A, 3B, 4); and applying energy to the modified end of the fiber (column 2, lines 14-46) to form a lens surface (60), wherein the lens surface continuously tapers outward to the outer circumference of the optical fiber member (Figures 3A,3B,4). Thompson does not teach that the modifying comprises removing material from the at least one end of the optical fiber member. Okubo teaches removing material from an optical fiber to form a lens tip with a desired focal length at the end of a continuous taper (column 8, lines 13-24 and column 10, lines 23-30). It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify the fiber member of Thompson by removing material, as taught by Okubo. The motivation would have been to more accurately and economically control the modification.

Regarding claims 6 and 11, Thompson teaches that the applying energy to the modified end comprises heating the modified end (exposing the modified end to a heat source) to form the lens surface (column 2, lines 14-46).

Regarding claim 7, Thomson teaches that the lens surface comprises a convex lens surface (Figure 4).

Regarding claim 10, Thompson teaches that the modified end has a first length, and wherein the applying energy comprises applying energy at a location along the length to from the lens surface at a position on the modified end having an angle of between 15 degrees to about 20 degrees (column 5, line 63 – column 6, line 8, wherein the angle is preferably 18 degrees).

Claims 3-5, 13-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of Okubo and further in view of US Patent to Yamane et al., number 5,459,803.

Regarding claims 3 and 4, Thomson in view of Okubo teaches the limitations of the base claim 1. Thomson does not teach that the modifying comprises etching the at least one end of the optical fiber member by subjecting the at least one end of the optical fiber member to an etching liquid. Yamane teaches modifying at least one end of an optical fiber, wherein the modifying comprises etching the at least one end of the

optical fiber member by subjecting the at least one end of the optical fiber member to an etching liquid comprising HF acid (abstract and column 4, lines 10-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson with the use of the etching liquid of Yamane. The motivation would have been to improve the efficiency of the modifying.

Regarding claim 5, Thompson in view of Okubo teaches the limitations of the base claim 1. Thompson does not teach that the optical fiber member comprises a material taken from the group consisting of glass, polymer and plastics. Yamane teaches that the optical fiber member comprises glass (column 3, lines 55-64, column 4, lines 1-9, and column 5, lines 55-66). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson with the glass fiber of Yamane. The motivation would have been to improve the durability of the fiber.

Regarding claims 13-16, Thompson teaches a method for manufacturing an optical fiber (Figures 3A, 3B, 4) comprising: providing a cylindrical fiber (F); modifying a first end of the fiber (column 2, lines 14-46) to form a tip continuously tapered to the outer circumference of the fiber (Figures 3A, 3B, 4); and heating the tip (column 2, lines 14-46) to form a lens surface (60) with a desired focal length which continuously tapers outward to the outer surface of the fiber (Figures 3A, 3B, 4). Thompson does not specifically teach that the lens surface has a desired focal length. Okubo teaches a modified fiber tip formed into a lens surface with a desired focal length (column 8, lines 13-25 and column 10, lines 23-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the desired focal length of Okubo in the

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modification step of Thompson. The motivation would have been to achieve greater control on the output light from the optical fiber. Thompson does not teach that the fiber is optically transparent (comprising a material taken from the group of glass, polymer, and plastics) and that the modifying involves etching. Yamane teaches a method for manufacturing a lensed tip optical fiber, wherein the fiber is optically transparent (column 3, lines 55-64, column 4, lines 1-9, and column 5, lines 55-66 teach a quartz-based glass fiber, which is intrinsically optically transparent); and a modification step includes etching (using a HF acid etching liquid) a first end of the optically transparent cylindrical fiber to form a tip (abstract and column 4, lines 10-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Thompson with the (transparent) glass fiber of Yamane. The motivation would have been to improve the durability of the fiber. It also would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson with the etching (HF acid liquid) of Yamane. The motivation would have been to improve the efficiency of the modifying.

Regarding claim 17, Thompson in view of Okubo and further in view of Yamane teaches the limitations of the base claim 13. Thomson also teaches that the lens surface comprises a convex lens surface (Figure 4).

Regarding claim 30, Thompson teaches an optical fiber (Figures 3A, 3B, 4) comprising: a first lens surface (60) formed on a first end of a cylindrical fiber (F), the first lens surface formed by modifying at least one end of the fiber (column 2, lines 14-46) to form an end continuously tapered to the outer circumference of the fiber (Figures

3A, 3B, 4); and applying energy to the modified end of the fiber (column 2, lines 14-46) to form the first lens surface (60), wherein the lens surface continuously tapers outward to the outer circumference of the fiber (Figures 3A, 3B, 4). Thompson does not teach that the modifying comprises removing material from the at least one end of the optical fiber member. Okubo teaches removing material from an optical fiber to form a lens tip with a desired focal length at the end of a continuous taper (Figures 1-4 and column 2, line 40 – column 4, line 19). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the fiber member of Thompson by removing material, as taught by Okubo. The motivation would have been to more accurately control the modification. Thompson also does not teach that the fiber is optically transparent. Yamane teaches a lensed tip optical fiber, wherein the fiber is optically transparent (column 3, lines 55-64, column 4, lines 1-9, and column 5, lines 55-66 teach a quartz-based glass fiber, which is intrinsically optically transparent). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Thompson with the (transparent) glass fiber of Yamane. The motivation would have been to improve the durability of the fiber.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomson in view of Okubo and further in view of US Pre Grant Publication to Cesaroni, US 2003/0029040.

Regarding claim 8, Thompson in view of Okubo teaches the limitations of the base claim 1. However, Thompson does not teach removing material from both ends of



the optical fiber member. Cesaroni teaches a fiber with lenses formed on both ends of the fiber. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson to include lenses on both ends of the fiber, as taught by Cesaroni. This modification would necessitate that the step of removing material be repeated on both ends of the optical fiber member. The motivation would have been to improve collimation and focusing of light entering and exiting the optical fiber member.

Regarding claim 9, Thompson in view of Okubo teaches the limitations of the base claim 6. Thompson also teaches that the heating comprises heating the modified end to form a lens surface (column 2, lines 14-46) on the modified end. Thompson does not teach heating both ends to form a lens surface on each end. Cesaroni teaches a fiber with lenses formed on both ends of the fiber. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson to include lenses on both ends of the fiber, as taught by Cesaroni. This modification would necessitate that the step of heating be repeated on both ends of the optical fiber member. The motivation would have been to improve collimation and focusing of light entering and exiting the optical fiber member.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of Okubo and further in view of US Patent to Grasso, III et al., number 6,375,651.

Regarding claim 12, Thompson in view of Okubo teaches the limitations of the base claim 1. Thompson does not teach moving the modified end to a spark. Grasso

teaches a method for manufacturing an optical fiber member comprising: modifying at least one end of an optical fiber member; and applying energy to the modified end of the optical fiber to form a lens surface (column 9, lines 3-23), wherein the applying energy comprises moving the modified end to a spark (column 6, lines 20-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson with the teaching of Grasso. The motivation would have been to expedite the formation of the lens.

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of Okubo and further in view of Yamane as applied to claim 13 above, and further in view of Cesaroni.

Regarding claim 18, Thompson in view of Okubo and further in view of Yamane teaches the limitations of the base claim 13. Yamane specifically teaches that the etching comprises etching the first end of the optically transparent cylindrical fiber (abstract and column 4, lines 10-22). Thompson in view of Yamane does not teach that the etching comprises etching both the first end and the second end of the optically transparent cylindrical fiber. Cesaroni teaches a fiber with lenses formed on both ends of the fiber. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson in view of Yamane to include lenses on both sides of the fiber, as taught by Cesaroni. This modification would necessitate that the step of etching, taught by Yamane, be repeated on both ends. The motivation would have

been to improve collimation and focusing of light entering and exiting the optical fiber member.

Regarding claim 19, Thompson in view of Okubo and further in view of Yamane and further in view of Cesaroni teaches the limitations of the base claim 18. Thompson specifically teaches that the heating comprises heating the first end to form a lens on the first end (column 2, lines 14-46). Thompson in view of Yamane does not teach that the heating comprises heating both the first end and the second end to form a lens on each end. Cesaroni teaches a fiber with lenses formed on both ends of the fiber. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson in view of Yamane to include lenses on both sides of the fiber, as taught by Cesaroni. This modification would necessitate that the step of heating, taught by Thompson, be repeated on both ends. The motivation would have been to improve collimation and focusing of light entering and exiting the optical fiber member.

Claims 21 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of Okubo and further in view of Yamane as applied to claims 3 and 15 above, and further in view of US Pre Grant Publication to Wei et al., number 2004/0134884.

Regarding claims 21 and 22, Thompson in view of Okubo and further in view of Yamane teaches the limitations of the base claims 3 and 15, respectively. Thompson does not teach that the etching liquid comprises oil on the top surface of the etching liquid. Wei teaches oil placed on the top surface of an etching liquid (page 2, paragraph

19). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thompson in view of Yamane with the oil of Wei. The motivation would have been to increase protection of the fiber (Wei, page 2, paragraph 19).

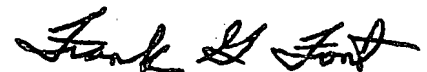
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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